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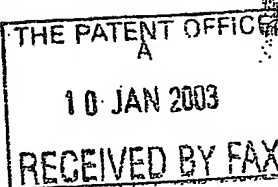
Anne Gersey

Dated 28 November 2003



Patents Form 1/77

Patents Act 1977
(Rule 16)



Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form.)

The Patent Office

Cardiff Road
Newport
South Wales
NP10 8QQ

1. Your reference

P03872GB

10 JAN 2003

2. Patent application number

(The Patent Office will fill in this part)

0300563.4

10JAN03 E776166-1 002820
P01/7700 0.00-0300563.4

3. Full name, address and postcode of the or of each applicant (underline all surnames)

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Patents ADP number (if you know it)

8489528001

If the applicant is a corporate body, give the country/state of its incorporation

GB

4. Title of the invention

CLEANING OF AIR

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

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Patents ADP number (if you know it)

1362300

13623002

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number
(if you know it)

Date of filing
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
(day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

- a) any applicant named in part 3 is not an inventor, or
 - b) there is an inventor who is not named as an applicant, or
 - c) any named applicant is a corporate body.
- See note (d))

YES

Agent's Ref: P03872GB

DUPLICATE

Cleaning of Air

- 5 This application relates to the cleaning of air, in particular the cleaning of air in a space in which a human or animal is resting, say lying or sitting.

 It has long been known that harmful agents can be borne by air. These harmful agents may include pathogens, such as micro-organisms, for example mould, bacteria
10 and viruses, allergens, such as pollen as well as dust and other detritus. Many solutions have been proposed to enable effective and efficient cleaning of air to remove such pollutants.

 When air is re-circulated in buildings, there is a tendency for such pollutants to
15 become concentrated in the air unless they are adequately removed. In buildings such as hospitals, schools and offices the presence of such pollutants can lead to acute and chronic illnesses and, in the worst cases, fatalities.

 In hospitals, hostels or the like the problems of airborne pollutants may be even
20 more acute as the patients may have deficient or suppressed immune systems and, thus, may be more susceptible to infection. Persons at home may also be susceptible to infection or may have particular allergies to such pollutants. Similar problems may occur in veterinary or animal hospitals.

25 Several solutions have been proposed to disinfect air. One such solution is disclosed in WO-A1-01/87362. The air disinfection apparatus disclosed therein has a chamber through which air can flow and an ultraviolet light source which projects light

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into the chamber to kill bacteria. The apparatus comprises a filter adjacent the inlet to remove larger particulate matter. The UV light source may project into the chamber or may be located in a separate housing, the housing being separated from the chamber by a UV light transparent screen, which is fabricated from quartz or the like.

5

In our co-pending British patent application no 0224897.9 we disclose an improved apparatus for cleaning air which overcomes problems associated with the prior art. The apparatus comprises a chamber having an inlet and an outlet for passage of air therethrough, a plurality of UV light sources to irradiate the interior of the chamber, including one or more shield members about each light source to reduce
10 deposition of air-borne detritus on the UV light source.

When attempting to maintain a 'clean air' environment in a large space, for example a hospital ward, it is necessary to have a large throughput of air through the
15 air cleaning apparatus. Such a large throughput requires commensurately large apparatus with a plurality of relatively intense UV lights to irradiate a large volume of gas. In many instances, large apparatus may be unwieldy or unwarranted, it may not fit into the available space or it may not be economically feasible.

20 One such situation is where, for example, one patient in a ward requires clean air due to a suppressed immune system, an allergy or the like, whilst the other patients have no such requirements. In that situation, is it plainly wasteful to clean the air for the entire ward when it is only required by a single individual.

25 Accordingly, a first aspect of the invention provides apparatus for cleaning air and emitting clean air into the breathe-space of an individual, the apparatus comprising a chamber having an inlet and an outlet, at least one UV light to irradiate air flowing

through the chamber and means to direct the clean air into the breathe-space of the individual.

5 A second aspect of the invention provides a bed, chair or the like to support an individual comprising apparatus for cleaning air and emitting clean air into the breathe-space of an individual, the apparatus comprising a chamber having an inlet and an outlet, at least one UV light to irradiate air flowing through the chamber and means to direct the clean air into the breath space of the individual.

10 A third aspect of the invention provides a method of maintaining a clean air atmosphere around the breathe-space of an individual, the method comprising passing air through a chamber and irradiating the air with UV radiation, passing the so-cleaned air into a region around the individual, so at least that region around the individual from which the individual inhales is filled with clean air.

15

The apparatus may comprise fan means to force the air through the chamber or passed the UV light source and into the breathe-space of the individual.

20 The apparatus may further comprise a filter to remove airborne detritus such as dust and the like. Preferably, the apparatus comprises a coarse downstream filter to remove any relatively large airborne particles and/or an upstream HEPA or other fine filter to remove any fine or remaining particulate matter held in the airstream.

25 The or each UV light is preferably located in a quartz tube which is located in the flow of air, the quartz tube preventing dust and other airborne particulates from occluding the UV light source. The or each light may be located about a quartz tube, the air flowing through the tube, in use.

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In a preferred embodiment, the apparatus is retained beneath a bed for a patient, clean air being emitted at the 'head' end and, in some cases, air to be cleaned being drawn in through the 'foot' end.

5 In order that the invention may be more fully understood, it will now be described, by way of example only and with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of a bed incorporating apparatus according to the invention; and

Figure 2 is a section through apparatus according to the invention.

Referring to Figure 1, there is shown a bed 1 having a frame 2 and a mattress 3. The frame has an intended 'head' end 4 and an intended 'feet' end 5.

15 The frame 2 is perforated with a plurality of apertures 6 at both the head and feet ends 4, 5.

Located beneath the bed 1 is air cleaning apparatus 10, having an upstream end connected to the feet end 5 of the frame 2 by tubing 11 and a downstream end connected to the head end 4 of the frame 2 by tubing 12.

Figure 2 shows a section through the air cleaning apparatus 10, with arrow A showing the direction of air flow. The apparatus comprises a quartz tube 15 through which the air flows. Mounted outside the tube 15 are a pair of UV lights 16. A metal reflector 17 may be located around the lights to reflect radiation into the flowing air. The whole is located in a casing 18. A coarse particulate filter 21 and a HEPA filter 22 are

5

located at respective up and down-stream ends of the apparatus 10. Fan means (not shown) force the air through the apparatus 10. Fan means may be located downstream or upstream or both of the apparatus 10.

5 In use, air is drawn through the apparatus 10 where it is filtered and cleaned of pollutants by the UV lights 16 and filters 21, 22. The cleaned air is passed along tubing 12 and into the hollow frame 2 at the head end 4 of the bed 1. The clean air is emitted from the apertures 6 to create a clean-air shroud over at least the head end 4 of the bed such that, any patient lying in the bed will breathe air from the clean air shroud
10 emitted from the frame and maintained at the head end of the bed 1.

Air may be drawn into the apparatus via apertures 6 in the frame at the foot end 5 of the bed 1.

15 In a further embodiment, air may be drawn from any location into the apparatus
10.

The or each UV light 16 may be located within a quartz sleeve which extends along or across the chamber 15. In a preferred embodiment, the apparatus 10 only
20 comprises a single UV light.

The apparatus may be used in a bed or in a chair, for example where clean air is emitted from the chair to create a shroud of clean air about the head of any person sitting in the chair. The apparatus may be used to maintain a clean-air atmosphere
25 about at least the head of an animal in a animal hospital or veterinary practice.

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The apparatus 10 may have a throughput of from 20 to 80 l/s or less. The apparatus may be able to maintain a shroud of clean air of between, say, 0.25 and 4 m³.

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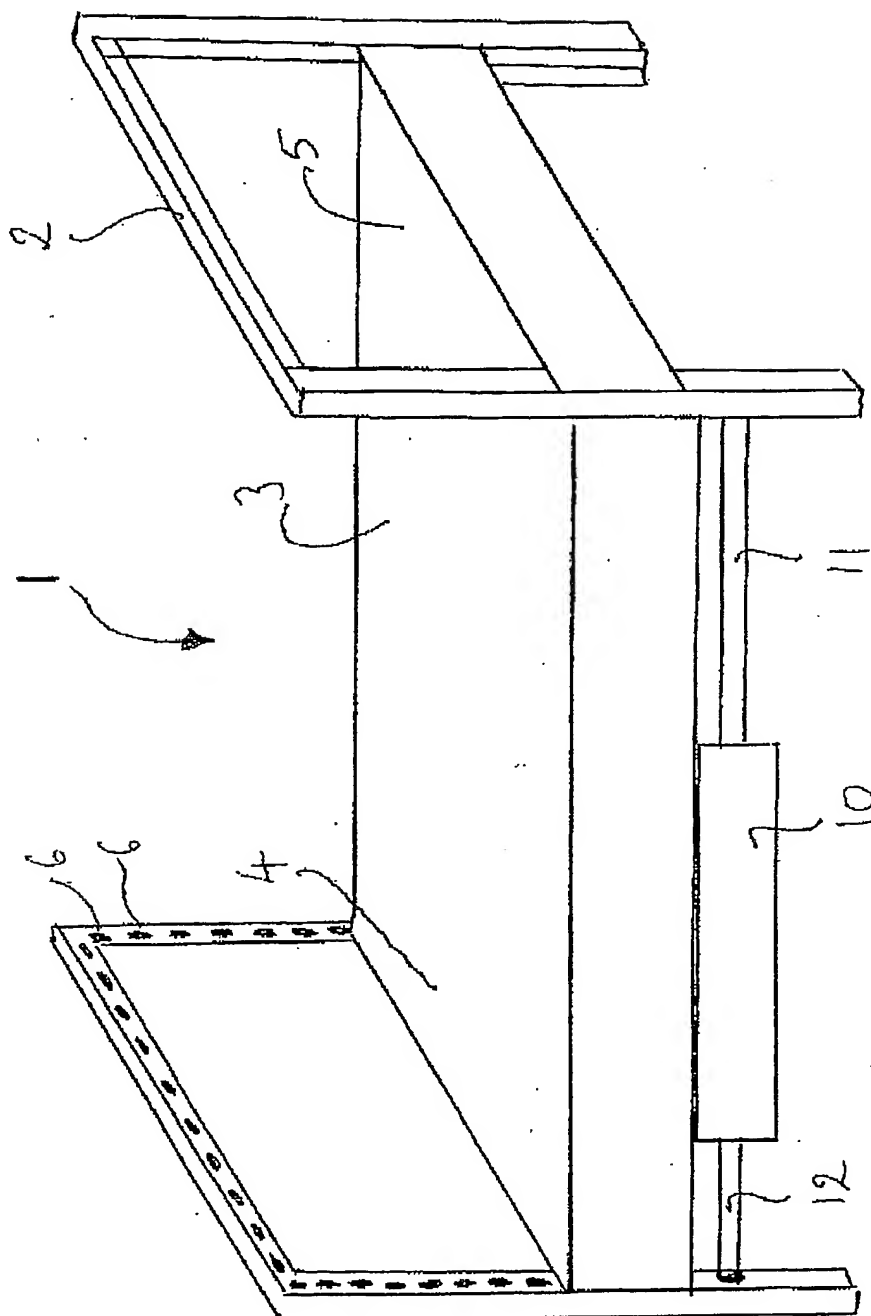


Figure 1

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